

REMARKS

Claims 11-23 were examined. All claims were rejected. In response to the above-identified Office Action, Applicants do not amend any claims, cancel any claims, or add any new claims. Consideration of the claims 11-23 in light of the following remarks is requested.

I. Claims Rejected under 35 U.S.C. §102

The Examiner rejected claims 11-23 under 35 U.S.C. § 102(b) as anticipated by “A Tutorial on Learning with Bayesian Network” by David Heckerman, March 1995, Microsoft, Revised November 1996, pp. 1-57 (“*Heckerman*”). However, Applicants believe *Heckerman* fails to disclose “each and every element of the claimed invention, *arranged as in the claim.*” *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984), emphasis added. Consequently, *Heckerman* does not anticipate the present invention as claimed, and the rejections should be withdrawn.

Heckerman lives up to its title: it is a tutorial that describes the mathematical foundations of Bayesian Networks (“BN”) and provides examples of the use of such networks in machine learning. Several examples should suffice to show why *Heckerman* does not anticipate the method of claim 11 and its dependent claims. The independent claim recites a method comprising several operations, including preparing a statistical summary of processed data in a database, and constructing a database structure to hold the statistical summary. The Examiner asserts that the first of these operations is anticipated by *Heckerman*’s Abstract. However, there is no mention of statistical methods in that section (or in the reference more generally, as far as Applicants can determine) that anticipate this claim element. The phrase “... summarize Bayesian statistical methods ...” (*Heckerman* Abstract, l. 12) describes how the

author plans to discuss the subject in the paper, not any specific operation undertaken on processed data.

Similarly, *Heckerman's* Table 1, identified by the Examiner as the claimed database structure, shows raw data records on which the example fraud detection model is to operate, not a statistical summary prepared from processed data in the database.

These two points provide perhaps the clearest examples of reasons why *Heckerman* fails to anticipate the claimed invention. More generally, *Heckerman* may be likened to a catalog of techniques for using Bayesian Networks. However, the Examiner has not identified, nor have Applicants located, any teaching or suggestion to combine the techniques in the specific way envisioned by Applicants in their invention. For at least these reasons, Applicants respectfully request that the rejection of claim 11 be withdrawn.

Claims 12-23 depend directly or indirectly upon claim 11, and are believed to be patentable for at least the reasons discussed above in support of their base claim. Many of these claims are also distinguishable from the prior art of record in their own right. For example, claim 12 refines the method of claim 11 by requiring that continuous variables in the database be discretized before preparing the plurality of statistical summaries. The portion of *Heckerman* the Examiner identifies as allegedly anticipating this operation actually explains that “[i]n multinomial sampling, the observed variable X is discrete...” Consequently, the observed variable is not continuous, and there is no point in “discretizing it” (since it is already discrete). Elsewhere, *Heckerman* mentions modeling a discrete variable ($\text{Age} \in \{\text{“age}<30”, “30 \leq \text{age} \leq 50”, “age>50”\}$) as a continuous variable – the opposite of the claimed discretizing operation (see *Heckerman* p. 12, ll. 15-16).

Claim 19 is another dependent claim that adds limitations not taught or suggested by *Heckerman* (over and above those in its base claim 11, as discussed above). Claim 19 requires the preparation of a plurality of hashes to cluster the

database records. The Examiner rejects this claim with the assertion that “the value of hashes are θ ,” but *Heckerman* explains in the cited material that θ (plural) are values of the variable Θ that correspond to the possible true values of the physical probability – quantities that are completely different from the hashes used for clustering. Applicants recognize that the Examiner is entitled to interpret each claim in the broadest reasonable sense, but respectfully submit that ascribing a meaning to a term that is explicitly contradicted by the description of the term in the reference *and* contrary to common usage is unreasonably overbroad. Applicants request that the rejection of claim 19 be withdrawn as well.

Similarly, claim 20 restricts its base claim 11, requiring the database to be structured as an alternating decision tree (“ADTree”). The Examiner asserts that an ADTree is a binary tree, and then rejects the claim over *Heckerman* because the reference uses binary variables. There are two difficulties with this analysis: first, the portion of *Heckerman* cited (p. 18, ll. 1-3, Figure 4) shows a Bayesian network structure with two binary variables, X and Y , but the structure is not a binary tree. Second, although ADTrees may be binary trees, not all binary trees are ADTrees. Thus, even assuming that binary variables imply binary trees, and that *Heckerman* teaches or suggests both, the reference *still* fails to anticipate claim 20 because it requires a specific type of (possibly) binary tree, with properties and semantics not shared by binary trees in general. (An introductory paper by Freund and Mason describing ADTrees is attached for the Examiner’s convenience.) For at least these reasons, Applicants respectfully request that the rejection of claim 20 be withdrawn as well.

As to the dependent claims not specifically discussed, namely claims 12-18 and 21-23, those claims are believed to be patentable for at least the reasons explained in support of independent claim 11. The Examiner is respectfully requested to withdraw all pending claim rejections.

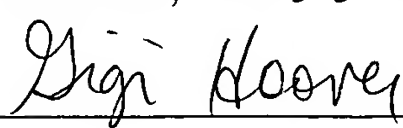
CONCLUSION

In view of the foregoing, it is believed that all claims now pending, namely claims 11-23, patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (503) 439-8778.

Respectfully submitted,
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